

## WHAT IS CLAIMED IS:

1. A magnetic sensor comprising a magnetoresistance effect element that contains a pinned layer and a free layer, said magnetoresistance effect element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer.

    said magnetic sensor being formed in such a manner that a plurality of said magnetoresistance effect elements are provided on a single chip, and the pinned layers of at least two of said plurality of magnetoresistance effect elements have magnetization directions that cross each other.

2. A method of producing a magnetic sensor comprising a magnetoresistance effect element that contains a pinned layer and a free layer, said magnetoresistance effect element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, said method comprising the steps of:

    forming a layer containing a magnetic layer that will become said pinned layer in a predetermined configuration on a substrate;

    forming magnetic-field-applying magnetic layers for applying a magnetic field to the layer containing the magnetic layer that will become said pinned layer;

    magnetizing said magnetic-field-applying magnetic layers; and

pinning the magnetization direction of the magnetic layer that will become said pinned layer with a magnetic field produced by a residual magnetization of said magnetic-field-applying magnetic layers.

3. The method of producing a magnetic sensor according to claim 2, wherein the step of forming said magnetic-field-applying magnetic layers is a step of forming said magnetic-field-applying magnetic layers so as to sandwich the layer containing the magnetic layer that will become said pinned layer in plan view.

4. The method of producing a magnetic sensor according to claim 3, wherein the magnetization direction of said magnetic-field-applying magnetic layers is different from a direction of the magnetic field produced by said residual magnetization.

5. A method of producing a magnetic sensor comprising a magnetoresistance effect element that contains a pinned layer and a free layer, said magnetoresistance effect element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, said method comprising the steps of:

preparing a magnet array constructed in such a manner that a plurality of permanent magnets are arranged at lattice points of a square lattice, where a polarity of a magnetic pole of each permanent magnet is different from a

polarity of other magnetic poles that are adjacent thereto and spaced apart therefrom by the shortest distance;

disposing a wafer in which a layer containing a magnetic layer that will at least become said pinned layer has been formed, above said magnet array; and

pinning the magnetization direction of the magnetic layer that will become said pinned layer by using a magnetic field formed between one of said magnetic poles and another of said magnetic poles that is adjacent thereto and spaced apart therefrom by the shortest distance.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100